

What is claimed is:

1. A method of estimating the relative impact of two or more patent portfolios of one or more companies, each patent portfolio of each company comprising patents belonging to at least one market segment, the market segment having a market size and a market growth rate, each company having a market share in one or more market segments, the method comprising the steps of:
 - a. categorizing a patent of the patent portfolio of a company into at least one market segment;
 - b. computing a Technological Strength Index (TSI) value for the patent, the TSI value of the patent being computed based on the number of forward and backward references of the patent;
 - c. computing an Economic Impact Index (EII) value for the patent, the EII value being computed based on at least one parameter from a set of parameters including market size of each market segment into which the patent is categorized, market growth rate of each market segment into which the patent is categorized, and market share of the company in each market segment into which the patent is categorized;
 - d. repeating steps a to c for each patent in the patent portfolio of the company;
 - e. computing a Company Innovation Efficiency Index (CIEI) value for the patent portfolio of the company, the efficiency impact value being computed based on Research and Development (R&D) expenditure of the company and number of patents in the patent portfolio of the company;
 - f. repeating steps a to e for each company; and
 - g. computing an Overall Index value for each patent portfolio, the Overall Index value being computed using at least one parameter from a set of parameters including the TSI values for all patents in the patent portfolio of the company, the

EII values for all patents in the patent portfolio of the company, and the CIEI value for the patent portfolio of the company,

whereby the Overall Index values for portfolios indicate the relative impact of their respective patent portfolios.

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2. The method of claim 1 wherein the step of computing the TSI value for the patent further comprises the steps of:

a. computing a normalized value for the number of backward references of the patent, the normalization being done based on the numbers of backward references of all patents in the patent portfolios of all companies;

b. computing a normalized value for the number of forward references of the patent, the normalization being done based on the numbers of forward references of all patents in the patent portfolios of all companies; and

c. computing the TSI value for the patent using the normalized value for the number of forward references and the number of backward references.

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3. The method of claim 2 wherein computing the normalized value for the number of backward references of the patent further comprises the steps of:

a. determining the maximum value of backward references among the number of backward references for all patents in the patent portfolios of all companies; and

b. normalizing the value for the number of backward references of the patent by dividing it by the determined maximum value of backward references.

4. The method of claim 2 wherein computing the normalized value for the number of forward references of the patent further comprises the steps of:

- a. determining the maximum value of forward references among the number of forward references for all patents in the patent portfolios of all companies; and
- 5 b. normalizing the value for the number of forward references of the patent by dividing it by the determined maximum value of forward references.

5. The method of claim 1 wherein computing the Economic Impact Index (EII) value for the patent further comprises the steps of:

10 a. computing a normalized value for market size of each market segment into which the patent is categorized, the normalization being done based on market sizes of all market segments, to which any patent of any patent portfolio belongs;

15 b. computing a normalized value for market growth rate of each market segment into which the patent is categorized, the normalization being done based on market growth rates of all market segments, to which any patent of any patent portfolio belongs;

20 c. computing a normalized value for market share of the company in each market segment into which the patent is categorized, the normalization of the market share of the company in a market segment being done based on the market shares of all companies in the market segment; and

25 d. computing the EII value for the patent using at least one parameter from the set of parameters including the normalized value for market size of each market segment into which the patent is categorized, the normalized value for market growth rate of each market segment into which the patent is categorized, and the normalized value of the market share of the company in each market segment into which the patent is categorized.

6. A method for ranking a plurality of companies based on their patent portfolios, the patent portfolio of each company comprising patents belonging to a plurality of market segments, each market segment having a market size and a market growth rate, each company having a market share in one or more market segments, the method comprising the steps of:

- a. categorizing a patent of the patent portfolio of a company into at least one market segment;
- b. obtaining market size for each market segment into which the patent is categorized;
- c. obtaining market growth rate for each market segment into which the patent is categorized;
- d. obtaining market share of the company in each market segment into which the patent is categorized;
- 15 e. obtaining the Research and Development (R&D) expenditure of the company;
- f. obtaining a number of backward references for the patent;
- g. obtaining a number of forward references for the patent;
- h. repeating step a to f for each patent in the patent portfolio of the company;
- i. computing a Company Innovation Efficiency Index (CIEI) value for the patent portfolio of the company, the CIEI value being computed based on R&D expenditure of the company and number of patents in the patent portfolio of the company;
- 20 j. repeating steps (a) to (i) for the patent portfolio of each of the plurality of companies;

- k. computing a normalized value for the number of backward references (NorNb) of each patent in the patent portfolios of the plurality of companies;
 - l. computing a normalized value for the number of forward references (NorNf) of each patent in the patent portfolios of the plurality of companies;
- 5 m. computing a normalized value for market share (NorMSh) of the company in each market segment into which one or more patents are categorized, the normalization being done based on market shares of all the companies in the market segment;
- 10 n. computing a normalized value for market growth rate (NorMg) of each market segment into which one or more patents are categorized, the normalization being done based on market growth rates of all market segments into which one or more patents are categorized;
- 15 o. computing a normalized value for market size (NorMs) of each market segment into which one or more patents are categorized, the normalization being done based on market sizes of all market segments into which one or more patents are categorized; and
- 20 p. computing an Overall Index value for the patent portfolio of each of the plurality of companies, the index value being computed using the values obtained in the steps (i), (k), (l), (m), (n) and (o);

whereby the rank of a company's patent portfolio is determined by the value of the computed Overall Index value.

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- 7. The method of claim 6 wherein NorNb of a patent is computed by normalizing the number of backward references of the patent using the numbers of backward references of all patents in the patent portfolios of the plurality of companies.

8. The method of claim 7 wherein the normalized value NorNb of a patent is computed by normalizing the number of backward references of the patent using the maximum value of the number of backward references among all patents in the patent portfolios of the plurality of companies.

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9. The method of claim 6 wherein NorNf of a patent is computed by normalizing the number of forward references of the patent using the numbers of forward references of all patents in the patent portfolios of the plurality of companies.

10 10. The method of claim 9 wherein the normalized value NorNf of a patent is computed by normalizing the number of forward references of a patent using the maximum value of the number of forward references among all patents in the patent portfolios of the plurality of companies.

15 11. The method of claim 6 wherein the normalized value for market size (NorMs) of the market segment is computed based on the maximum market size among market sizes of all market segments into which one or more patents have been categorized.

20 12. The method of claim 6 wherein the normalized value for market growth rate of the market segment is computed based on the maximum market growth rate among the market growth rates of all market segments into which one or more patents are categorized.

13. The method of claim 6 wherein the normalized value for market share of the company in the market segment is computed based on the maximum market share of any of the plurality of companies in the market segment.

5 14. The method of claim 6 further comprising the step of computing a Company Technology Strength Index (CTSI) value for a company, the CTSI value for the company being computed as a summation of the products obtained by multiplying the NorNf and NorNb values of each patent in the patent portfolio of the company, as per the equation,

$$10 \quad \text{CTSI}_{\text{patent portfolio}} = \sum_{k=1}^{k=t} \text{TSI}_{\text{patent_}k}$$

where $k = 1$ to ' t '
and ' t ' is the number of patents in the patent portfolio.

15 15. The method of claim 6 further comprising the step of computing a Company Economic Impact Index (CEII) value for a company, the CEII value being computed as a summation of the products obtained by multiplying the NorMs, MorMg and NorMSh values of each patent in the patent portfolio of the company, as per the equation,

$$\text{CEII}_{\text{patent portfolio}} = \sum_{k=1}^{k=t} \text{EII}_{\text{patent_}k}$$

20 where $k = 1$ to ' t '
and ' t ' is the number of patents in the patent portfolio.

16. The method of claim 6 wherein the Overall Index for the patent portfolio of a company is computed using the equation:

$$\text{Overall Index}_{\text{patent portfolio}} = \text{CTSI}_{\text{portfolio}} * \text{CEII}_{\text{portfolio}} * \text{CIEI}_{\text{portfolio}}$$

5 17. A computer program product for estimating the relative impact of two or more patent portfolios of one or more companies, the patent portfolio of each company comprising patents belonging to at least one market segment, the market segment having a market size and a market growth rate, each company having a market share in one or more market segments, the computer program product comprising:

10 a. program instruction means for categorizing each patent of the patent portfolio of a company into at least one market segment;

15 b. program instruction means for computing a Technological Strength Index (TSI) value for each patent of the patent portfolio of the company, the TSI value of the patent being computed based on the number of forward and backward references of the patent;

20 c. program instruction means for computing an Economic Impact Index (EII) value for each patent, the EII value being computed based on at least one parameter from a set of parameters including market size of each market segment into which the patent is categorized, a market growth rate of each market segment into which the patent is categorized, and a market share of the company in each market segment into which the patent is categorized;;

25 d. program instruction means for computing a value for Company Innovation Efficiency Index (CIEI) value of the patent portfolio of the company, the CIEI value being computed based on Research and Development (R&D) expenditure of the company and number of patents in the patent portfolio of the company;

5 e. program instruction means for computing an Overall Index value for the patent portfolio of each company, the Overall Index value being computed using at least one parameter from a set of parameters including the TSI values for all patents in the patent portfolio of the company, the EII values for all patents in the patent portfolio of the company, and the CIEI value for the patent portfolio of the company.

18. The computer program product of claim 17 wherein the program instruction means for computing the TSI value for the patent further comprises:

10 a. program instruction means for computing a normalized value for the number of backward references (NorNb) of the patent, the normalization being done based on the numbers of backward references of all patents in the patent portfolios of all companies;

15 b. program instruction means for computing a normalized value for the number of forward references (NorNf) of the patent, the normalization being done based on the numbers of forward references of all patents in the patent portfolios of all companies; and

20 c. program instruction means for computing the TSI value for the patent using the normalized value for the number of forward references and the number of backward references.

19. The computer program product of claim 18 wherein the program instruction for computing normalized value of the number of backward references (NorNb) of the patent further comprises:

25 a. program instruction means for determining the maximum value of backward references (Nb_{max}) among the number of backward references for all patents in the patent portfolios of all companies; and

b. program instruction means for normalizing the value of the number of backward references of the patent by dividing it by the determined Nb_{max} value.

20. The computer program product of claim 18 wherein the program instruction means for computing the normalized value of the number of forward references of the patent further comprises:

5 a. program instruction means for determining the maximum value of forward references (Nf_{max}) among the number of forward references for all patents in the patent portfolios of all companies; and

10 b. program instruction means for normalizing the value of the number of forward references of the patent by dividing it by the determined Nf_{max} value.

21. The computer program product of claim 17 wherein the program instruction means for computing the EII value of the patent further comprises:

15 a. program instruction means for computing a normalized value for market size of the market segment into which the patent is categorized, the normalization being done based on market sizes of the market segments into which one or more patents have been categorized;

20 b. program instruction means for computing a normalized value for market growth rate of each market segment into which the patent is categorized, the normalization being done based on market growth rates of market segments into which one or more patents have been categorized;

25 c. program instruction means for computing a normalized value for market share of the company in each market segment into which the patent is categorized, the normalization of the market share of the company in each market segment being done based on the market shares of all companies in the market segment; and

d. program instruction means for computing the EII value for the patent using at least one parameter from the set of parameters including the normalized value for market size of each market segment into which the patent is categorized, the normalized value for market growth rate of each market segment into which the patent is categorized, and the normalized value of the market share of the company in each market segment into which the patent is categorized.

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